

MEMOIRS FOR THE INGENIOUS.

CONTAINING
Several Curious Observations in *Philosophy,*
Mathematicks, Physick, History, Philology, and
other Arts and Sciences.

IN
Miscellaneous Letters.

By J. DE LA CROSE, Eccl. Angl. Presb.

NOVEMBER, 1693.

To be continued Monthly.

VOL. I.

*Quidquid facies, citò redi à corpore ad animum : hunc diebus ac nocti-
bus exerce : Labore modico alitur illud. Hanc exercitationem non
frigus, non aestus impedit, ne senectus quidem. Id bonum cura, quod
vetustate fit melius. Seneca Epist. 15. ad Lucilium.*

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April, May, June, July, August, September, and *October.* 7

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Memoirs for the Ingenious.

NOVEMBER, 1693.

LETTER XLIII.

To the Right Reverend Father in God
William, Lord Bishop of *Litchfield* and
Coventry, Lord Almoner to Their
Majesties.

ARGUMENT.

The Author's design in writing these Memoirs, and what means he has to perform it. Occasion and Subject of this Letter: Whether Nebuchadnezzar was transmuted into an Ox? That the Transformation was not real, but only a Madness. Such Metamorphoses prov'd impossible. Idea's and Perceptions are independent from the Soul. What the Senses contribute to them. The strongest Objection against the Immortality of the Soul answer'd at large. Seven Axioms laid down. The state of the Soul in a sound Sleep, in Swoons, in Drunkenness. Remarkable qualities of some Drinkers. Of Madness. That the Soul of a Madman acts more rationally to follow the appetites of her disturb'd Body, than if she did conform her self to a compos'd state. Of Virgins and Womens Longings. Why we see Bodies with such or such Proportions? An Argument by the By against the Indifferency of Religions.

A a a

Religions. Instances drawn from the Holy Writ, Judg. vii. 2 Kings iii. 22, 23. vi. 15---23. vii. 6. 7. The Transmutation of Nebuchadnezzar prov'd not real by the Sacred Text. The sense of the word Tedar. What kind of Dreams and Madness can be remembred. Of the Daughters of Proetus.

My Lord,

(a) See
Lett. I. p. 3.

There was never a time, where I stood in need of your learn'd Conversation as much as I now do, nor ever any, where I had less opportunity to enjoy it. For I am hurried away with business, and that too with so little respite, that a Mile or two keeps me at a distance from the persons for whom I have the greatest veneration. In the meanwhile several Gentlemen, who judge of my Learning by such a bold Attempt, as the writing of *Memoirs for the Ingenious*, propose to me difficult Questions in all sorts of Sciences, as tho' I were a living Library, or had an *Encyclopaedia* in my head. They may remember (a) that my first design was to translate the *Physical and Mathematical Memoirs of Paris*, and some Observations out of the *Journal des Savans*, if at any time the Learn'd of this Kingdom should not supply me with a sufficient number of Papers to fill up a monthly Book. But either by neglect or misfortune, I could get but one of the *French Memoirs*, since *August 1692*, the *Journal des Savans* has few things besides Abstracts; and the Ingenious of this Country send me Objections and Problems, instead of Experiments and Dissertations. In such hard circumstances, there is little likelihood, that I can continue longer than this year.

The only comfort I have is, that this way of writing Letters, affords me an occasion to court the friendship of the Learn'd, and to return publick Thanks to those that have not despis'd a Foreigner, who had no other Friends or Recommendation but his Pen. Your Lordship being one of the first, who has giv'n me sensible marks of his affection, I ought not to have been so backward in shewing my acknowledgment: But what could I offer to the celebrated Doctor *Lloyd*, that was not too trivial for him, tho' I should penetrate into the innermost recesses of Antiquity, both Sacred and Prophane, unfold the most intricate difficulties of *Chronology*, and explain the most puzzling passages of the Holy Writ, of the ancient Fathers, and other *Greek* and *Latin* Authors? But I am not like ever to attain to such a high degree of knowledge; for *Chronology*, *History*, and *Philology*, are not complicated Lines, Numbers or Idea's, which can be dis-

intangled,

intangled, and put into a clear and methodical order by meditation ; but they consist of matters of Fact, that require an universal reading, and such a vast and compleat Library, as is far beyond my Means, and, perhaps, those of any private Man. However, after many deliberations, chusing rather to be thought presumptuous, than to be accus'd of Ungratefulness, I humbly present your Lordship with some thoughts concerning one of the chief Objections against the *Immortality of the Soul*.

A Gentleman, who does not subscribe his Name, asks my Answer to some Difficulties he finds in the supposed transmutation of *Nebuchadnezzar* : ' This Transmutation, *says he*, was either real, or only a ' madness, some such distemper as that which the Physicians call *Lycanthropia* ; wherein the affected persons fancying to be turn'd into ' Wolves, become as cruel and dangerous to Men as those murdering Beasts, if they be not secur'd. Granting that the Transmutation was real, you must own withal, that the rational Soul can be ' annihilated ; or what is all one, that it can be reduc'd to the lowest ' Species of Spirits, if Beasts have any sort of thoughts. Neither ' will it serve your turn to have recourse to raving Diseases ; for what ' does it help a mad Man to be endued with Reason, if he be not ' conscious of it ? What were the thoughts of that frantick Emperor, during those seven years, that *he ate grass as Oxen, his hairs grew like Eagles feathers, and his nails like Birds claws* ? Dan. iv. 32, 33. ' Did his rational Faculty sleep so long ? If not, what weaken'd on a ' sudden that magnanimous Soul, who could head numerous Armies, ' and rule so many and so large Kingdoms ?

This is the short of my anonymous Adversary's Objections, which I do not dissemble in the least. I answer then, That the Transmutation was not real, but only a Madness : Because such a Transmutation is impossible ; not out of any defect of power in God, for all the Creatures would be annihilated, if he only ceas'd to will their existence ; but by reason that the most perfect Being cannot alter his Will, or be liable to Inconstancy, which proceeds from want of fore-knowledge ; he shall never cease to will the existence of his Creatures, and therefore they shall never cease to subsist.

This is the chief natural ground of the Immortality of my Soul : for I am conscious to my self, that my Soul and my Body are two distinct Substances, (since notwithstanding their strict union in this life, they act independently from each other in several occasions. For instance, my Soul (I understand by this word the principle of my thoughts) contributes nothing to the digestion of the Aliments, and divers other mechanick actions of the Body : and the Body is but a

remote, and not an immediate cause of most of the speculative Notions and Operations of my Soul. I grant that the Senses are the occasional cause of most of my Sensations and Idea's. I should not have the Idea of a Tree, had I never seen nor heard of it, but having once gotten it, all the Trees in the World might be annihilated, and my own Eyes and Ears too, that I should not cease to have it. The Reason of it is, that neither the Senses nor the Soul are the Creators, if I may use that expression, of those Idea's, but the Senses are only as so many Windows, through which the Soul receives or contemplates that spiritual light, which subsists, from all Eternity, in the infinite Wisdom, the Creator of the World, and the supreme reason of all Intelligences, who communicates it to finite and subordinate Spirits, according to the different reach of their Capacities.

But against this it may be urg'd, That the Soul cannot act without animal or vital Spirits, some very minute particles of blood, which by their striking the *fibres* and nerves of our brain, or running through them, arise or occasion our perceptions and thoughts. That the Soul cannot act without these Particles, they endeavor to prove thus: If she could act without 'em, certainly she would, since according to us, her very essence consists in thinking; and if she should act, we should be conscious of her operations: but we are not conscious of the operations of the Soul, in a sound Sleep, in a Swoon, in Drunkenness, Madness, &c. And therefore the Soul does not then act, being destitute of vital Spirits, or because those unruly Corpuscles will not obey her orders. Whence they infer, That the Soul depends upon the Body in all her operations, and that when she shall be separated from it, she shall lie in a sort of inactivity and silence, or have no other existence than that of an insensible Atom, till by some other happy revolution she chances to be united to another body. This is the short of whatever *Hobbs*, L—— the *Socinians*, a late Author, under a *Mahometan* disguise, could offer more rational against the Immortality of the Soul. So that if I can clear this Objection, I may boast to have run down those enemies of Mankind and themselves.

In answer to it, I say that this Sophism is a continual *series* of false or equivocal Suppositions, which I shall make appear by supposing nothing but what is plain and uncontestable by our own experience. 1. It cannot be deny'd, that there are confus'd and distinct Perceptions. 2. That we remember easier clearer, than intricate Notions. 3. That simple or separate Idea's, tho never so distinct, cannot be remembred long: but that to be retain'd a considerable

time,

time, they must be many in number, concatenated together in a very methodical order, aiming all at the same scope, and making up what we call an Argument, a Discourse, or a Dissertation. 4. Separate Idea's, as the particular objects of our Senses, the words of several Languages, &c. can be engraven on the memory, but 'tis only by the repeated strokes and frequent course of the vital Spirits within some certain nerves of the brain, in which they dig a free passage, and through which afterwards they become apt to run, as through a broad, deep and declining Channel. 5. Confus'd Notions proceed from different objects, making each together, and at the same time, their respective impressions upon the brain; so that when these impressions are equally strong, they cannot affect the *Oval Center*, or whatever other place is the seat of the Soul, so as to rise any distinct Perception: even as Needles could not pierce a Bladder, if their sharp ends cover'd its whole surface, so as to leave no empty place, where the skin press'd down by each Needle could spring up again. 6. In this state of Mortality, 'tis neither the Soul nor the Body alone that are the Man, but Soul and Body united together constitute our Being. This is the cause that we are not sensible of many operations which the Body performs alone; and, on the contrary, that we are not aware of those thoughts which the Soul has by her self during a sound Sleep, a Swoon, Fits of Drunkenness, and Madness, when they are past, &c. 7. As the Soul is the nobler part of our selves, and that which is to remain entire after death, so it has been made to rule the motions of the Body, and would still keep the command in all necessary occasions, had she not suffer'd her self to be seduced so far by passions and corporeal pleasures, as to let the vital Spirits become unruly, and their motions irregular. A plain proof of this is, that tho in this general depravation of humane nature, not one Man hath kept an absolute command over the motions of his Body, yet those who endeavor so to do, who mind more the perfection of their Soul, than the satisfaction of their Body, spiritual than corporeal enjoyments, get sometimes more clear Perceptions in one day, than the others in one month, and I dare say, in the whole course of their Lives.

By these few and undeniable Propositions, I hope to clear all the Doubts.

I. Tho we are not sensible of the operations of the Soul during a sound Sleep, it follows not that she does not think, but only that the vital Spirits, striking weakly, but equally, and on all sides the seat of the Soul, hinder mutually each other's impressions, so that there cannot arise from thence any distinct Notions, to be perceiv'd
and

and remember'd by the *whole Man*, according to the second, fifth and sixth *Propositions*. We know, by self-experience, that a Spirit can be aware of the motions of Bodies; but we know not that a Spirit having lost its thinking faculty can recover it by any corporeal motion whatsoever; and 'tis but just, that the objectors should supply us with some instances of the like nature, before we can adopt such strange conceits.

But as an overplus I shall add some probable reasons, which increase my persuasion of the Soul not ceasing to think, even in the deepest sleep. First, There is nothing more common than to dream, and not to remember our dreams. Nay, those confus'd dreams leave sometimes such extraordinary footsteps behind them, that had we the power of *Nebuchadnezzar*, perhaps we would gather as many Astrologers as he did, to find out what they were. Secondly, It is likewise not unusual to dream, that we dream not; for it oft happens that the Soul is conscious to her self her body lies in a sleep, and being displeas'd with that confinement, because she would contemplate some Ideas wherewith she is taken up, she forces the vital Spirits, that have remain'd about her, to move through the fibres and nerves, which are fit to represent those Ideas, and that with such a quick and lively motion, that she is apt to infer her body is awake, and not sleeping. Thirdly, Those, who are healthful and us'd to command their passions and the motions of their body, may oft wake themselves at what hour of the night they please, if they are firmly resolv'd to do it, for some important occasion. Now, considering that we can break our sleep meerly by our will, but never procure it by that faculty alone, what other reason of this difference can be contriv'd besides this; that Sleep is a calm and quiet state of the Body, which the Soul alone cannot produce in it, because Spirits cannot act upon bodies without the help of other bodies; whereas she can disturb that tranquility almost whenever she lists, because she never rests her self, but only allows quietness to the body for its refreshment, and that it may be better able to perform her commands.

II. One may argue in the same manner of Swoons, as we have done of sleep, allowing that a disease puts the Soul in a greater incapacity to command the vital Spirits than weariness does. I know many stories concerning this subject, but because I have none whose credibility I can averr, and I want self-experience, God having preserv'd me hitherto from such accidents, I proceed to another head.

III. As to Drunkenness, I lack again self-experience; for an uncivil company, by forcing strong liquors upon me, would rather kill me

me than make me drunken, that is, disturb my Reason so far as to make me talk nonsense, discover the secrets of my friends, do unbecoming actions, and the like. But instances of this kind are so common, that I have had occasion enough to make observations upon them. 1. There are men so wary that knowing, they shall meet with a company, where plentiful Cups will be drunk, and where 'tis not safe for them to talk their mind freely, desire some of their friends to come thither sober, and to pull them by the sleeve, if at any time they went about to discover themselves. It has been done accordingly, and observ'd that by this motion, which was so insensible, as scarce to be perceiv'd by the rest of the company, they became mute in a moment, and could not be made to speak upon that subject afterwards. This shews the great power of the Soul, even in that intoxication and universal sedition of the vital Spirits, that she should still keep so much force, as to stop their unruly motion in an instant, whenever she is made aware, that it will prove dangerous to her well-being. 2. The most part of Drunkards are not so prudent; however there are few, who drink to that excess as to be incapable to pay their reckoning, and to go staggering home; which shews again, that the Soul is not so quite depriv'd of her Empire, as not to be able to preserve a man from utter destruction. 3. I have seen others, who knowing the Proverb, *In vino veritas*, fuddled themselves on purpose, to speak more freely the truth of those whom they hated or lov'd. I was amazed at it, and suspecting some cheat, I examined closely these men, but perceived so many uncounterfeited signs of drunkenness, as wild looks, a red face, a stammering speech, senseless discourses, a discompos'd countenance, wavering steps and the like, that I gave over my suspicions, and concluded that the Soul comes never entirely to lose the power she has over the body, as long as its organs are fit for life and action. The reason of it is plain in this instance, since in pursuance of a former resolution, which she remembers still at the presence of those whom she will affront or commend, notwithstanding the present intoxication, she can move the unruly spirits through the fibres and nerves of the brain and tongue, that are fit to utter such and such discourses. And tho such things may happen undesignedly, yet the power of the Soul is not much less; for this proves still, that even in that disturbance of her body, she may discern her friends from her foes, and find out means to fawn the former, as well as to be revenged from the latter.

IV. There are so many sorts of madness, that it would require a large Volume to treat of them all; but that of *Nebuchadnezzar* being the highest

highest degree, if I can explain this strange Phænomenon, and shew that the Soul acts rationally, that is to say, consequently or conformably to her perceptions, even in a man who imagines himself to be a beast, none may say any more, that she lies then in a state of inactivity and silence.

First of all I would fain ask my Adversaries, why they grant a low degree of reason to beasts (none of 'em for ought I know being a *Cartesian* in this point) and deny it to such a Madman. For, their opinion is only grounded upon this, that beasts by a natural instinct, which they call an inferior sort of knowledge, seek what is proper for the preservation of their being and well being. So did likewise our frantick Emperor, for he did not foolishly starve himself, but not relishing the meat and drink of men, nor being able to speak as they do, away he ran into the fields, there to eat grass with his new Comrades the Oxen, to bellow with them, and to walk fourfooted as they do. Had he remained in his Palace, he had proceeded irrationally, for he had exposed himself to an infallible death, either out of hunger, sorrow or weariness.

Thence I infer, that a Madman, who proceeds according to his false perceptions, acts more wisely, than if he did proceed as a healthy, sober and well composed man. This will be taken for a jest or paradox by some pretenders to Wit and Learning; but I never writ so disingenuously, or in a style so unbecoming a Christian and my Profession. I speak the true sense of my mind, and even hope to make my assertions sensible to the meanest capacity, before I have done with 'em.

Every one is acquainted with the strange longings of Women, and of those unlucky Virgins, who are troubled with the Jaundice. The longings of the former are so strong, that they will endanger the Mother and the Child, if they be not speedily satisfied, or the Child at least will bear all his life a mark of the distemper of its Mother. As to the latter, tho their modesty often hinders them from shewing their weakness, yet they cannot forbear eating privately Plaister, Ashes and the like, and to keep 'em from it is the right way to kill them; for these insipid things are strong *Alcalis*, that temper the excessive acid of their stomach.

It goes even so with Madmen. *Nebuchadnezzar*, saw, heard and relished things like an Ox, he bellowed and had the same longings with those beasts; and therefore his Soul, who aimed at the preservation of the whole Compound, acted rationally or conformably to her false perceptions, to carry him over into the fields, there to feed with those beasts; and to proceed otherwise was to expose the man to a certain death.

Let's

Let's suppose some men born and brought up in a Tower built in the middle of a Plain, near the High-road, amongst Towns, Villages, Castles, Trees, Gardens, Cornfields, Meadows, Vines, Rivers, Hills, Forests, and whatever can divert the sight. Let's suppose again that these men never stir'd abroad, nor had communication with any man living, but with one another; that the Windows of their Prison cannot be open'd nor broken, tho they be made up of a transparent matter like our magnifying Glasses, which increases the objects to the double, triple, or quadruple of what we mean to be their natural bulk; so that these men never saw any visible thing, nor even themselves, in the same proportion we would have seen them. I ask whether it be possible, that these Prisoners should have the same Ideas of bodies with us? No certainly, for the senses, the windows of the Ideas, are different: So that if they came to draw inferences like ours, it would be by some false and unaccountable supposition; for a Spirit ought to judge by his natural, perpetual or constant perceptions, otherwise he will certainly mistake. And I am apt to think, that the Eyes of a Mite represent to that animal an insensible corpuscle as big as our own do an Elephant to us.

Your Lordship sees that this is the case of Madmen, and that their Soul acts rationally, when she proceeds according to her false judgments, since the only cause of her mistakes is the false relations of the senses, her judgments being otherwise consequent and reasonable. If it be objected that the Soul of *Nebuchadnezzar* might have remembred, that she animated a great Emperor, whom it became not to run naked into the Fields, and feed there with Oxen. I answer, that she might remember all that, without being able to help it, because the constitution of her body was so alter'd, that it relish'd no other diet, exercise or diversion, but such as please those Beasts, and therefore it must have it or dye.

Our Adversaries believe, that *an invincible ignorance disculp*s; which is true, tho the consequences they draw from thence are not so; viz. that an erroneous conscience lies in an invincible ignorance, because every one is firmly persuaded, that what he believes is the truth, and therefore that all Religions are indifferent. But no ignorance may be called invincible besides such as proceeds from the false relations of the senses, whereas the ignorance of those, who err in the fundamental Articles of natural and reveal'd Religion, comes only from prejudices, laziness, distractions and the like. Every rational Creature may find out that there is but one eternal and supreme Being, and every Christian may easily know that there is but one

Mediator betwixt God and man, and therefore Idolaters and Papists are inexcusable. In the mean while I infer that since madness is a distemper of the body, being grounded upon the false relations of the senses; the Soul in that state of invincible ignorance cannot be accus'd of irrationality, as long as she judges and acts according to her perceptions.

Even in morals, we do not use to call that man Imprudent, or a Fool, who has dealt with all the possible circumspection, be the success never so unhappy. Were the *Midianites* Fools, when they fled before the 300 men of *Gideon*, *Judg. VII.* No, but they were perswaded that the God of the *Israelites* was a powerful Spirit, who had performed wonderful feats in *Agypt*, and that when he would take the part of that people, there was no fighting against them. The stratagem of *Gideon*, his blowing of Trumpets in the middle of the night, with the shewing of kindled Lamps within broken Pitchers, and the sudden clamours of his small Army, frightened them at that rate, that they imagin'd that powerful Spirit, Favourer of their Enemies, had brought down all the Angels of Heaven to kill them, and consequently to their panick terrors, endeavour'd to save their life by a swift flight. Thus the *Moabites* seeing the River, behind which the *Israelites* were encamp'd, as red as blood, because of the Sun shining upon it in the morning, concluded too rashly that *Judah* and the ten Tribes had fought together, and destroyed one another; and full of that deceiving confidence ran disorderly to their Camp, as to a place of prey, *2 Kings, iii. 22, 23.* The fears of *Elisha's* Servant, when a strong detachment of the *Syrian's* Army had surrounded his Master and him, in the little Town of *Dotham*, were more reasonable; but he grew calm in a moment, when God open'd his Eyes, and he saw the mountain full of *Horses and Chariots of fire, round about the Prophet.* And tho it be probable that *Benhadad* had given to the General Officers of that Detachment the Picture of *Elisha*, and the Draught of *Dotham*, so that they could not but discern them from any other man and place, and that nevertheless they suffered themselves to be led into *Samaria*, and delivered into the hands of *Joram* King of *Israel*, by the Prophet: yet no body did ever call their mistake a folly, because it proceeded from an invincible ignorance; *they were smitten with blindness*, says the H. Writ, that is, the Rays of light were so reflected to their Eyes, that they could not know *Elisha*, nor the place where they were, *2 Kings vi. 13--23.*

I could quote many instances of the like nature, as the mistake of *Judas*, the *Jews* and *Roman Soldiers*, who came to seize on our Saviour

viour, *John* xviii. 4--7. The *Syrians* raising the Siege of *Samaria*, upon a suppos'd noise of *Chariots, Horses, and a great Host* that march'd to its relief, *2 Kings* vii. 6, 7. But these will suffice to conclude, that since we use not to say of those that are mistaken by an invincible ignorance, or even in a conclusion drawn from probable grounds, that they have lost their Reason; so we ought not to esteem the Soul of Madmen a stupid and insensible thing, forasmuch as she draws Inferences, which, considering the present state of her Body, especially the false relations of her senses, are almost as just as those that she formed before.

It remains only that I should shew, that the expressions of the Sacred History agree with my Metaphysical Notions, or that it appears by the Text, that the change of *Nebuchadnezzar* was not a real Transmutation, but only a Madness. The Sentence pronounc'd by an Angel during that Emperor's Dream, begins thus: *Hew the Tree down and destroy it, yet leave the stump of the roots thereof in the earth.* The Prophet tells us, that the King himself was that strong and flourishing Tree, and therefore its Body was his own natural Body; its Branches, in a moral sense, his Family, Attendants and Courtiers; its Leaves and Flowers, his Riches and Greatness. All this was fell'd down and destroy'd, however not so as to be burn'd, or turn'd into another substance; but so as to lie on the ground *amidst the grass, to be wet with the dew of heaven, and to have his portion with the beasts of the field*; not for an undetermin'd time, but till seven times, or years, had pass'd over him, *Dan.* iv. 23. And therefore the *stump of the Tree-roots* signifies in the physical sense the *rational Soul*, that constitutes the essence of a Man, and distinguishes him from a Beast, as it does his reinstallation upon the Throne in the political signification, *ver.* 27. For both were left *in the earth*, tho the former was fetter'd with a band of iron and brass, that is, darken'd and troubled with the sensations and affections of a Beast.

It may be objected, That I have suppos'd all along, that our frantick Emperor ran away into the fields, of his own motion, whereas 'tis said, *they shall drive thee from men*, which seems to include a violent expulsion. Knowing the veneration that the Eastern Nations have for their Kings, I humbly conceive that when his mad Fits began, all his Court star'd at 'em; he was shut up in his Palace, and Physicians were immediately call'd, who could find no remedy for his disease. But remembering his former Dream with *Daniel's* interpretation, or being told of it, they acknowledg'd the power of Heaven, and advis'd his Attendants, that the only way to

keep their Master alive, was to let him have his will, and to run into the fields to graze with the Beasts; which was done accordingly, and several Herdsmen committed to take care of this precious Ox. It is in this sense that I understand that part of his Sentence, *וּמִן־אֲנָשִׁים לֵךְ טֶרֶדִין* *Ve min Anaska lac tardin; and they shall drive thee from men*, ver. 32. For I hardly believe that the Chaldaic word *טרד* *Terad*, should import so much as to *expel* or *drive out by force*, which our Translation seems to include, I rather take it for a word appropriated to Herdsmen in *driving* their Cattle before them, especially because *טרד* *Tarad* signifies in Hebrew, *to be laborious*, or *continually at work*, which is the property of Oxen.

But I must answer an Exception that would run down my whole System, viz. *That Men do not remember what they have done or said in a raging Fever, or Fits of madness.* This Assertion proves not exactly true, for it goes with those distempers as with Dreams. When the course of the vital Spirits is so irregular and confus'd, as to produce no concatenation of Idea's; tho' the Soul be sensible of them at the time of their rise, yet she cannot remember them, according to the

Prop. Pag. her capacity is too limited for it, and she cannot retain such Perceptions, even when we are awake. And therefore ridiculous Gestures, insignificant Actions, incoherent Discourses, made or spoken in Drunkenness, hot Fevers, and Fits of Madness, may and must needs be quickly forgotten. But when the Dream or Madness consists in a series of Perceptions, aiming all at one design, and making up together as a whole Scene of imaginary affairs, they may be easily retain'd, and are likewise commonly so; such is the Madness of those who fancy themselves to be Emperors, Angels, Dead-men, &c.

I need not to prove, that the Madness of *Nebuchadnezzar* was of this last rank; for 'tis plain by the sacred History, that he imagin'd himself to be an Ox, and acted according to his Perceptions, he had a *Beast's heart*, and *ate grass* with 'em. I have prov'd, that this kind of Madness can be remember'd, and *Nebuchadnezzar* must needs have been very sensible of his own, since it was but to finish on condition of his Repentance, *Till thou know that the most High rules in the Kingdom of Men, and gives it to whomsoever he will*, ver. 25. *At the end of those days I Nebuchadnezzar lift up mine eyes unto heaven, and mine understanding return'd unto me*; that is, the right use of my Reason, who was troubled by that strange distemper.

Tho the mad Symptoms of this Emperor have nothing incredible in them, yet to prevent the impertinent exceptions of some Would-be-wits, it will not be besides the purpose to shew their possibility by other instances. I am apt to believe, that most of the *Metamorphoses* of *Ovid* have been fram'd upon such strange Relations misunderstood, wrested or abus'd. But there is one, wherein the truth of this conjecture does evidently appear, viz. the renown'd distemper of the daughters of *Prætus* King of *Argos*, who liv'd about 2693 of the world, as my Authors say. The Heathen Fables tell us, that these two or three Princesses having presum'd to prefer themselves to the Goddess *Juno*, she turn'd them into Cows. But *Virgil*, more ingenuous and reasonable than the deluding Priests of the Idolaters, gives sufficiently to understand, that it was but a Madness which made those Princesses bellow, run through the Fields, and be afraid of the Plough like Cows.

Prætidæ implerunt falsis mugitibus agros.
 ----- *Quamvis collo timuisset aratrum*
Et sæpe in levi quassisset cornua fronte.

His ancient and learned Commentator *Servius* calls those Princesses *Lysippe*, *Hipponoe*, and *Cyrianassa*, and adds, that *Melampus* a Physician, Son to *Amythaon*, having obtain'd from *Prætus*, *Cyrianassa* in marriage, with part of his Kingdom for her Portion, he cur'd them all three, by pacifying *Juno* with Sacrifices, and dying [with black *Elleborum*, according to *Pliny*] a Fountain wherein they used to drink. The matter of Fact is so certain, that the whole History was engraven on a Stone near this Fountain, as may be collected from an Epigram extant in *Vitruvius*, l. 8. c. 3. But what need I other Proofs for those contradicting Spirits, than to send them to *Bethlehem-Hospital*, or *aux petites maisons de Paris*, where they will find many *Nebuchadnezzars*, and wherein the least of their deserts is to be secur'd for all their life.

L E T T E R

LETTER XLIV.

To Mr. William Pate.

ARGUMENT.

Several uses of Algebra for the improvement of Natural Parts, of Philosophy, Mathematicks and Mechanicks. Solution of three Algebraical Problems, with their operation set down at large.

S I R,

IF only the Ingenious with whom I am acquainted had been pleas'd to supply me with some Papers, I had not been obliged to apply my self to so many sciences foreign to my profession. I rely'd chiefly upon you for Philosophical and Mathematical entertainments; but hitherto, you have not thought either the publick, or these *Memoirs* worthy of your pains. Do not therefore expect great performances from a young beginner in Mathematicks. I present you with the solution of three Algebraical Problems, because they have puzzled some of my Masters. The two first are taken out of the *Synopsis Algebraica*, printed for the use of the Boys of *Christ's Hospital*, at the expences of Mr. *Edm. Brewster*, at the *Crane* in *S. Paul's Church-yard*, so that I thought them adapted to my capacity: Whereas it seems, that the Author endeavour'd to find out such questions as appear very easy at the first sight, tho they are difficult at the bottom. As to the rest his method is pretty short and plain.

Perhaps some Readers will censure me for applying my self to a science, which they look upon as an unnecessary curiosity, and much more for presuming to insert the solution of some Algebraical Problems in these *Memoirs*. But I desire them to consider. 1. That
this

this Book to answer its Title must be a Miscellany of different Observations. 2. That in indifferent things none ought to set up his own inclinations for the rule and standard of others, since there are Algebraists who care as little for Metaphysicks as some Metaphysicians do for Algebra. 3. That this last Science is as proper and more to raise and enlarge the understanding as any other part of Mathematicks. For it uses us to fix the mobility of our thoughts, to meditate upon one and the same subject a considerable time, and to look and turn it on all sides; a great deal of attention being required to get a right notion of a Problem, in which there are but some few things known, that seem to be foreign to the question, whilst the main point is unknown, and will, I dare say, remain so, to any other besides an experienced Algebraist. These are qualifications so necessary, not to be imposed upon by Sophistry, Authority, Passions and Prejudices, that I believe not great progresses can be made without them in any Science whatsoever. 4. Algebra quickens the imagination and improves the Reasoning faculty, when it teaches us to find out equations, to sever known from unknown things, and to rid our selves by degrees from all the latter, besides one, which being compared to what is known gives a solution or is the Key of the whole Problem. 5. Algebra is the foundation of Arithmetick; for unless it be the four general Rules in entire numbers, which are plain of themselves, I doubt whether ordinary Arithmeticians can demonstrate the other operations they make, as the Golden Rule, the Rules of Progression, of Company, of false position simple and double, the doctrine of Fractions, the extraction of the Square and Cubic root, &c. 6. Algebra is not only the foundation of Arithmetick, but may also give it all the improvements it can possibly receive; as appears by Problems, which Algebraists do daily resolve, tho they are far above the reach of common Arithmeticians, who cannot extract the square-root of an unknown quantity, much less when that quantity is a Cubic, a third, fourth, fifth power, &c. 7. The 2^d, 5th and 6th Books of *Euclid* seem to have been invented by Algebra, they flow so naturally from it; even all the parts of Mathematicks can be demonstrated, and consequently improv'd by its means, and I know of an Algebraical Secret by which the art of fortifications may be carried to a greater perfection, but my love for Mankind is too great to publish such a dangerous invention. 8. Algebra using us to distinguish betwixt questions that are determined and those that are undetermined, I am confident that whatever is knowable both in contiguous and continued quantities can be discovered by an Algebraical method. 9. Algebra is not only useful in Sciences and

and Liberal Arts, but also in Mechanicks, whenever we have occasion to find out the unknown force of Gravity, Motion, Wind, Water, Fire, Springs, &c. 10. A great and sensible use of Algebra, is in abridging Arithmetical Operations, and avoiding those mistakes that are apt to slip, in the reducing of a great number of Fractions, and other long and troublesome Calculations. For because the former numbers vanish, when we substitute others in their room, we may easily forget 'em, the capacity of our Soul being taken up with the mean design.

All this will appear in the following Problem, which is very difficult and almost insoluble, without this use of Letters.

A General commanded an Army, whose Foot was triple to the Horse, there deserted $\frac{1}{12}$ — 120 of the Foot, and $\frac{1}{15}$ \times 120 of the Horse. Then he engag'd in a Battel, and after the Fight, he sent the sick and wounded into Garisons, that together with those that accompany'd them, in order to reinforce the said Garisons, made up $\frac{1}{4}$ of the whole Army; so that he kept but $\frac{3}{8}$ of it with him, the rest being either kill'd or taken Prisoners, to which last number if you add 3000, that Summ will be equal to the $\frac{1}{2}$ of the Foot that he had at the beginning. What was the number of the whole Army, and of each of those parts?

There seem to be seven or eight unknown quantities, tho there is really but one, viz. the whole Army; and those many Fractions that would prove so puzzling, should we go to work by Figures, will help us to find it out, if we make use of Letters. Let's then state rightly the Question, and calling z the whole Army $\frac{3}{4} a$, $\frac{1}{4} b$, $\frac{1}{15} c$, $\frac{1}{12} d$, 120 e , $\frac{3}{8} f$, 3000 g , $\frac{1}{2} k$, we have presently the parts of the Equations $az = \text{Foot}$, $bz = \text{Horse}$, $da z - e = \text{Foot deserted}$, $cb z \times e = \text{Horse deserted}$, $bz = \text{sent into Garison}$, $fz = \text{left behind}$. Now 'tis certain that if you abstract from the whole Army the Horse and the Foot that deserted, with those that were sent into Garison and left behind, the rest will be = kill'd and Prisoners, to which $g = 3000$ being added, gives us the first Equation, viz $g \times z - da z - cb z - bz - fz = kaz$. Let us now endeavour to sever the unknown from the known quantities: z , whatever it be, is an entire number, of which $abcdfk$ are Fractions, will reduce then z to a Fraction, or put an Unite before it, saying, $g = da z \times cb z \times bz \times fz \times kaz - 1z$, and therefore leaving out z .

$$g \div \text{---} = z$$

$$da \times cb \times b \times f \times ka - 1$$

$$b \times f \times ka = \frac{8}{8} = 1 - 1 = 0, \text{ there remains then only } da = \frac{2}{48}$$

$$\times cb = \frac{1}{85} \text{ both } = \frac{288}{3840}, \text{ which being reduc'd to the least Fraction,}$$

give

give $\frac{3}{40}$ for the divisor of $\frac{3000}{1}$, the Product is 120000, which divided by 3, the Quotient is 40000 = 2 the whole Army; and therefore 30000 = Foot, 10000 = Horse, both = 40000 the whole Army. Out of the Foot deserted $\frac{1}{12}$ — 120 = 2380, out of the Horse deserted $\frac{1}{25}$ ✕ 120 = 620, both = 3000, which being added to 12000, the number of the kill'd and Prisoners make up $\frac{1}{2}$ of the Foot; $\frac{3}{8}$ which he kept still = 15000 with $\frac{1}{4}$ sent into Garisons, = 10000 are again the summ of the Army.

The second Problem is conceiv'd in these terms: 'Some young Men and Maids having din'd together, ow'd 37 shillings to the Landlord, whereof each young Man was to pay 3 shillings, and each Maid 2 shillings. But if there had been as many young Men as there were Maids or contrariwise, *Sique fuissent tot Juvenes quos fuerunt Virgines & e contra*, each however paying with the former proportion, they had spent 4 shillings less. It is requir'd to find out the number of the young Men and Maids.

All the difficulty of this Problem consists in understanding that Phrase, which I have inserted in the own words of the Author, for it does not signify that in the 2^d Supposition the young Men and Maids were in equal number, Algebra shewing this to be impossible; but that the question must be alternately understood, and the numbers substituted to each other by turns. Let's then take y and z for the young Men and Maids, a for 3, b for 2, c for 37, d for 33. By the first Hypothesis ay ✕ $bz = c$, and therefore $ay = c - bz$. And by the second Hypothesis alternately understood, az ✕ $by = d$. Now because $ay = c - bz$, therefore $by = \frac{bc - bbz}{a}$. And there-

fore az ✕ $\frac{bc - bbz}{a} = d$. Multiplying by a , $aa z$ ✕ $bc - bbz$

$= ad$. Subtracting bbz from $aa z$, and bc from ad , remains $5z = 25$ or $z = \frac{25}{5} = 5$. And therefore had they paid 33 shillings, there had been five young Men, and nine Maids; but because they ow'd 37 shil. there were nine young Men, and five Maids.

The third Problem is propos'd by *Henrion*, in his *Commentaries upon Euclid*, Three Merchants associated had gain'd an hundred pound, which they were to divide proportionably to what each had put in the common treasure. The Summ of the first with the Gain was equal to the two others taken together. The Summ of the second with the Gain double to the two others. And the Summ of the third with the Gain also triple to the two others. What was the whole Summ, and the Quota of each Merchant?

This Problem seems very difficult, for here are four unknown quantities, and but one known, viz. the Gain, that is only giv'n to determine the Question, lest we should imagine at random three Summs equal, double and triple amongst themselves, and then say that we resolv'd the Problem. Neither do I see any means to find out the whole Summ at once, as we have done in the first Problem, and therefore must needs make three Operations.

Let x, y, z , be the names of the quota's of each Associate, a the Gain. The question will be thus stated in letters, $x \boxplus a = y \boxplus z$, $y \boxplus a = 2x \boxplus 2z$, $z \boxplus a = 3x \boxplus 3y$. Because $x \boxplus a = y \boxplus z$, therefore $2x \boxplus a =$ the whole Summ put in by the three Associates. And now x is something known, we'll make use of it to discover the rest. $y = x \boxplus a - y$. Adding a on both sides, and multiplying by two, because an Unite cannot divide; $y \boxplus a = 4x \boxplus 2a - 2y$. leaving out one a on each side, and putting the y together. $3y = 4x \boxplus a$. And therefore $y = \frac{4x \boxplus a}{3}$.

3

To find out z , I say $x = \frac{2}{3}x$, and therefore $x \boxplus y = \frac{7}{4}x \boxplus \frac{a}{3}$, whence follows $z \boxplus a = \frac{21}{3}x \boxplus \frac{3a}{3}$, or $7x \boxplus a$, and therefore $z = 7x$.

As to x , it will give us no trouble, for since we have found that $x \boxplus \frac{4}{3}x \boxplus \frac{a}{3} \boxplus 7x = 2x \boxplus a$, or the whole Summ. Multiplying all by 3, it follows that $3x \boxplus 4x \boxplus a \boxplus 21x = 6x \boxplus 3a$, or $28x \boxplus a = 6x \boxplus 3a$. and therefore $22x = 2a$; and $x = \frac{2a}{22} = \frac{a}{11}$ ($= 9 \boxplus \frac{1}{11}$; $y = \frac{4x \boxplus a}{3} = \frac{126 \boxplus 4}{11} = (45 \boxplus \frac{5}{11})$; $z = 7x = 63 \boxplus \frac{7}{11}$).

3

3

Any common Arithmetician may examine these Operations, for I have set 'em down at large, that young Beginners may learn not only an Algebraical Nicety, but also the method of making Equations, with the reason of each of them. For tho good Sense, Invention and Judgment be the greatest helps to find out Equations, yet a true and plain method is such a necessary improvement of those natural qualities, that they will not go very far without it. This makes me hope that you will take in good part my present Address, knowing the Latin Proverb, *Hæ Nugæ seria ducunt*.

Novemb. 18. 1693.

L E T T E R

LETTER XLV.

To the Honoured Dr. Richard Morton,
one of the Governours of *Christ's*
Hospital, and of the Colledge of Phy-
sicians, of *London*.

ARGUMENT.

*Five strange Relations of heterogeneous bodies extracted, or
come out of humane bodies. The fourth Relation inconsistent
with Anatomy. The fifth Relation prov'd impossible by the
common notion of gravity. Why the Bodkin mentioned in
the first Relation came down through the Anus without any
Ulceration? Why the Pin mentioned in the second, caus'd an
Impostume in the left Buttock? The third Relation explain'd.
Incredible smallness of the Seeds and Eggs of some Plants
and Insects, and their prodigious numbers. The Circulation
of the blood represents that of the Water on the surface of the
Earth. Why the Worm, taken out of the incised vein, was
carried so far as the extremity of the Arm, and how it was
bred and encreased there?*

Honoured Sir,

THo the design of these Memoirs engages me to insert some
strange *Phenomena* of Physick in these Papers; yet I do not pre-
tend to erect my self into an Interpreter of all the secrets of Nature,
since she has a great many, which she keeps conceal'd from her
dearest *Mystæ*. I am content with bearing the part of a faithful Hi-
storian, who endeavours to distinguish between credible Relations,

and groundless Reports; being neither too ready to believe out of weakness and admiration, nor too forward to reject out of pride and self-conceit. And therefore I take sometimes the liberty to propose my difficulties to the greatest Artists, among whom, the publick voice, your happy Cures, and your Learned Books, have justly rank'd you.

In 1624, one *John Stevinson*, Servant to the Earl of *Anchram*, having the Palate, or *Uvula* of his Mouth down, endeavour'd to pull it up with a Bodkin, five inches long, taken out of a Tweezer, and of the figure that is here represented. But the Palate getting



hold of the broad end of it, which he had put into his Mouth, took it quite out of his hand, where he had only the little end; so that he suck'd it down with his breath. It remain'd five weeks within his Stomach, that he felt but little pain, only if he should chance to lye on the side of the point, it would prick him, and wake him in the night, were he in never so sound a sleep: Afterwards it descended from the Stomach into the small Guts; where by reason of the windings of the bowels, it caus'd such an intolerable pain as to make the Patient fall into frequent swoons. In that lamentable condition, he went to Sir *Theodore de Mayerne* for counsel, who began the cure by the frequent injection of Clysters, made up especially of a good quantity of Butter and Oyl, to open the passages, and make them more slippery. Then he purg'd him with an Infusion of *Sena*, wherein *Manna* and *Cassia* were diluted; which produc'd so much effect as to convey the Bodkin into the great Guts, and by degrees through all the intestins; only it stay'd a month on the right side, where it was thought it would have bred an Impostume, and burst through it. To prevent this, Sir *Theodore* order'd him to go twice a week into a Bath of more than warm Water, and there to drink a pint of Olive-oil with Sugar, to drink another pint of Oyl every morning, a quart of Whey an hour after, and to make as much exercise as he could. By these laxative liquors, the Bodkin was carry'd away as by a torrent, and voided with the excrements, without any exulceration, nor even inflammation. The pain had brought the Patient very low, but soon after he recover'd a perfect health. He was yet alive 22 years after, *June 17, 1647*, being then 50 years of age: at which time, he subscrib'd an attestation of the

the matter of fact, that I have in my hands; in which 'tis observ'd, that he had still the Bodkin to shew, and that it had been in many Kings, Queens, and Princes hands.

Mr. *Dupuy*, a learned *French* Physician, whom the late persecution has forc'd to take Sanctuary in this Country, has communicated to me an observation of his of the same kind, but with different and remarkable circumstances. In the month of *May*, 1669, being at *Fontaine-le Comte*, Capital of Lower *Poitou*, he was fetcht by a Surgeon for a sick Woman, whom he found lying in bed. She told him that ever since 6 months, she had been troubled with a violent pain in the middle of the left Buttock. But coming to view that part, he perceiv'd there neither pulsation, heat, inflammation, tension, nor any other of the accidents that use to preceed Impostumes. However feeling that her Pulse was irregular, seeing her face overheated, and hearing her complain of a violent thirst, he judg'd that in the middle of that Buttock, there was an interior Impostume, chiefly because she was troubled with a languishing Fever that redoubled upon her every evening. And therefore he ordered the Surgeon to prepare a dressing, and then to pierce the affected part with a Lancet, but there came nothing out of it. The Woman was notwithstanding drest. This was done in the morning; about six in the evening the Physician and Surgeon came again, and as soon as the Tent was taken out of the opening, there came out a full pint of a purulent matter as black as Ink.

Lest an excessive evacuation should bring the Patient into a Swoon, Mr. *Du Puy* order'd another dressing to be quickly applied to it. The following day he found this Woman very weak; for the corrupt matter had thrust the tent and plaister from the wound, besides that, the Patient complain'd of an intolerable smart, that she felt just at the hole of the Ulcer. Our Physician prying into the wound to discover the cause of that pain, perceived something heterogeneous, that would, as it were, come out of it self. Whereupon taking the Surgeon's Pincers, he extracted out of it a great Pin, such as the Country People there use to tye their Shirts with. That sort of Pins are somewhat uncommon here, and the figure of it will shew this relation not to be impertinent.



Inquiring into the cause of this strange Phenomenon, he was told by the Woman, that 3 months after her Marriage, as she was in a Summer evening hunting the Fleas of her Smock, she found this Pin on the ground, which she put into her mouth. Her Husband who was in bed rising softly came and gave her a blow on the Buttocks; which frightening her, made her swallow the Pin, that had remained 3 years in her body, when it came out through this Impostume. *I have kept this Pin, says Mr. Du Puy in a Letter to me, to the time that the Persecution drove me out of France, and shewn it to every curious. The cure was finished with digestives and injections, and the Woman was well in health, when I went out of the Kingdom.*

The same Gentleman has related me another story, that has appeared incredible even to an ingenious Physician, viz. That being once present at the bleeding of a Lady, one of his Patients; the blood, after it had sprung out in the quantity of about two ounces, staid on a sudden: and as he was looking for the cause of it, he perceived an heterogeneous body that stoppt the opening of the vein, whereupon taking the Surgeon's small Pincers, he drew out a Worm as big as could come out of the incision.

I have by me an original Letter dated from Grendon, February 10. 1668. and written by one Ann Aubrey, wherein she asserts as a truth that a Pin past through the Elbow of a Kinswoman of hers, where she had a great pain, and that their Son, Skimper, by handling of it felt the proportion of a Pin, and by the clear light of the Sun did discover its point, which was to their great admiration, and caused the whole Family to come and see it. After that with his own hands, by some instrument, he drew it out without any great pain, and the Patient had not ever since any great pain in that arm. *It was conceiv'd by many able Doctors that the Pin being swallow'd was conveyed from the Liver by the blood into the Arm.*

The Gentleman who has communicated this Letter to me, assures me by another to have read in Sir Theodore de Mayerne's papers, that a woman that had swallow'd a Pin was some time after seized with a violent Head-ach, upon which ensued a swelling inflammation and ulcer at one of her ears, whence the Pin was extracted.

But notwithstanding the respect I have for that ingenious friend, and for Sir Theodore de Mayerne's memory, I cannot believe these two last stories. The reasons of my incredulity are, that whatever descends as far as the throat, is thrust down by the root of the tongue as by a shovel, and by the successive dilatation and compression of the gullet, into the stomach, where if it be a matter that can be diluted by the ferment of that Ventricle, it will be bruiz'd and reduc'd into a thick grey pap, and let down through the inferior mouth,

mouth of the stomach into the small guts. But if it be a hard substance, as a Pin, it must needs stick or remain there, till by some strong fermentation that pap be made very liquid, and the hard substance carry'd down, as by a flood into the said small guts. There the bruiz'd matter, which we call *Chyle*, undergoes a second fermentation, running along the *Duodenum*, (a) *Jejunum* and *Ileum*, by an acid coming out of the *Pancreas*, an acrimonious liquor flowing out of the Liver, and a lymph squeez'd out of the glandules of the Intestines. This abundance of different liquors render the *Chyle* extremely fluid, precipitate his gross and terrestrial parts, and whatever is not proper for nutrition, which descend through the *Cacum* (b) and *Colon* into the *Rectum*, there to remain till they be in so great a quantity that by their own weight they may dilate the *Sphincter*, and open themselves a door to be evacuated, under the name of excrements. In the mean while the most subtle parts of the *Chyle* transpire, or are imbib'd, by a glandulous or pappy substance, that is the fourth tunic of the small guts, and has communication with the milky veins. From these veins the subtiliz'd *Chyle* runs into the glandules of the *Mesentery*, where it is filtrated and diluted again by a lymph carried thither from several Vessels. Then going through the two glands call'd *Lumbaria*, it ascends through two branches into the *Canalis Thoracicus*, or Channel of the Breast, which discharges it into the *Subclavia Vasa*, and those into the *Vena Cava*, that carries it to the heart, where by its mixture with the blood it undergoes a new fermentation, and takes the name and red colour of the blood. Both are forc'd by a *Systole*, or contraction of the heart into the lungs, whence they descend through the *Pulmonarian* vein into the left ventricle of the heart to be fermented again, indued with all the qualities of blood; and driven by another *Systole* into the great artery, which distributes it through all the members, both above and under the heart.

(a) The
Names of
the Small
Guts.

(b) The
Names of
the Great
Guts.

He that understands the words sponge, glandule, filtration, membranaceous substance, who knows that the lacteal and lymphatick veins, the channel of the chest, the small and great guts have *valvules*, or folding doors, which hinder the matter that is driven into those vessels from running back, and that the blood must pass through veins and arteries of an incredible smallness, before it can be carried into the arms, will not be apt to believe, that such a gross body as a Pin can penetrate so far as the Elbow.

The fourth story of the Pin coming out through the Ear, is liable to difficulties that are still more sensible than the former. 1. We use not to say that a thing has been swallow'd, unless it has past the

root of the tongue, and entred into the gullet. 2. When liquors or chew'd meat are descended so far, they are necessarily thrust down, partly by their own weight, and partly by the contraction of that membranaceous pipe. 3. We know that Iron is much heavier than an equal quantity of liquor and chew'd meat. If therefore liquors and chew'd meat fall into the stomach by their own weight, by what engins can a Pin come up, and ascend as far as the tympanon of the Ear?

It helps not to alledge, that there is a sensible hole or cavity going from the Ear to the Palate, to give passage to the air, which if it were altogether shut up, a violent sound would break the small bones, skins and membranes that inserve to the hearing. And accordingly it has been observ'd, that a deaf person may be made to hear the sound of a Lute, if it be plaid upon whilst he holds its neck betwixt his teeth, the air or sound let in through this passage striking the inward side of the tympanon of the ear, which communicates this tremulous motion to the nerves and fibres of hearing that end at the common sensory. If this observation prov'd true, it would be useful to make the deaf hear, by speaking into their mouth through some resounding instrument. But however it be, it will not avail any thing as to the present case, since tho' propuls'd air can thrust up other air, yet it will never follow, that a mass of Iron, proportionably equal to another of liquor and chew'd meat, can ascend upwards, whilst the weight of the latter forces them to go down.

As to the first and second relations, I believe them to be true. 1. Because the Bodkin and the Pin went not through any veins, arteries or muscles, through the heart, the lungs, or the liver, which would be impossible, but descended immediately into the stomach, whence they were carried into the bowels, more or less slowly, according to the quantity of liquor in which they swam. 2. The spiral situation of the bowels would have rendred the passage of these long, sharp and rigid bodies impossible, if the intestines were unmoveable; but because they have a *Peristaltick* and *Antiperistaltick* motion, that is, that they move to and fro, according to the course of the *Chyle* and humours, turning about themselves like worms, this motion help'd by degrees the passage of these heterogeneous bodies; which tho' they might often stick in some part of the bowels, yet were afterwards taken off by overflowing liquors. 3. Its by these inward floods, that the pain of *John Stevinson* was eased, and the Bodkin carried away without ulceration; the many mollifying injections, purgarives, oyls and baths, which he used by Sir *Theodore's*

dore's directions, preserving the bowels from the sharpness of the Bodkin, stretching them, furthering their motion, and making it slide more easily. But as to the Woman who had swallow'd the Pin, because she used no remedies, that heterogeneous body might well be brought down by its own weight, and the natural motion of the Intestines, not being half so long as the Bodkin; but it being sharp, was apt to stick at length in some parts of the *Rectum*, as it did also.

To explain the third History, I suppose 1. That the seeds and Eggs of some Plants and Animals are of an incredible smallness, tho they contain all the essential and integrant parts of that plant and animal, which come to be unfolded in time, proportionably to their increase. For instance the seed of an Aspin tree has scarce half a line in length, and produces however a tree several fathoms high. 2. Because our Eyes are dim and short-sighted, we ought not to judge that those plants and animals, whose seeds and eggs we cannot discover, are produced at random, or by an equivocal generation; but considering that nature is constant and uniform in her operations, we ought rather to believe that she follows still the same course, bringing forth all plants and animals out of seeds and eggs, tho we cannot always perceive them, either because of their own smallness, or of some outward impediment. 3. The use of Microscopes having discover'd in this Age a vast number of Seeds, Eggs and insensible Animals that had been hitherto unknown, it is but rational to conclude, that were our instruments better, our diligence and accuracy greater, and nothing hindered us to pierce to the very bottom of things, we might find out the true causes of whatever a presumptuous Ignorant ascribes to chance or occult qualities. Mr. *Leuwenboeck* assures that in (a) 15 cubical inches of Spawn, which a Cod-fish may emit in a year, there are ten times more living Animals than Men upon the face of the Earth; that he has seen likewise a prodigious number of these insensible creatures, in the spawn of Pikes, Trouts, Carps and Tenches, as well as in the sperm of Dogs and Cocks. And it can hardly be said that these suppos'd animals are but particles of the fermenting spawn or sperm, because they live a considerable time after they are taken out of the animal. 4. This at least is certain, that all animals whatsoever come out of worms, which move, and receive nourishment, and increase as soon as the Mother has conceiv'd. This is sensible even to the bare eye in Embryo's that are taken out of female animals, which approach more or less of the figure of a Worm, as the time when they were extracted is near or remote from their conception. 5. Some Plants, which the ancient Herbalists suppos'd to be produc'd without seeds,

(a) *Ondelste
Onzicht-
baarheden.
Leyde 4.
1686.*

(a) See
Letter XXX.
p. 229.

as the Fern, the Wall-rue. *Ruta muraria*, the Wool-blade or Moon-wort *Lunaria*, the *Polypus*, the Hart-tongue, the Serpent-tongue, the *Capillary* of *Montpellier*, &c. have been found to have not only small seeds, but some of 'em Cods fill'd with two or three hundred grains, and these Cods however are insensible to the eye. 6. Flying Insects (a) lay also a prodigious number of Eggs, which may be hatch'd out into Worms, within 24 hours, if they light on a convenient warm place; and quickly increase to a considerable bulk, if they find abundance of food. 7. Tho all such Worms come out of the Eggs of flying Insects, and may be transmuted into them, yet this transmutation is not always made, because want of air, room, and other conveniences may hinder it. 8. The circulation of the blood may be represented by that of the Water on the surface of the Earth, imagining the heart to be as the Ocean, the extremities of the body the places of the Springs, the small and great veins the Brooks and Rivers, that carry that vivifying liquor to the heart, and the arteries the subterraneous Channels, that bring it again from the heart to the extremities of the body.

After these few postulates, which are almost undeniable, our third relation has little difficulty in it. 1. The Egg of some flying Insect had been swallowed with meat by this woman (for Flies use to lay their Eggs in places where they may find food as soon as they are hatch'd out) 2. This Egg being descended into the Small Guts, was not forced down with the excrements, being as small and light as any particle of the *Chyle*, and went therefore with them into the milky veins through all the pores of the filtering glandules, the heart, the lungs, the *Aorta*, till arriving at last to the extremities of the fingers, it remain'd there intricate amongst their small arteries and veins, and was there hatch'd out by the most convenient and natural heat of the blood and flesh. 3. Having thus gotten the life and motion of a Worm, it swam for greater ease and room into the arm above the fist, and following still the cherishing liquor wherein it was bred, it came to the incision of the vein, whence Mr. *Du Puy* extracted it.

December 1.

LETTER XLVII.

To the Right Reverend Father in God,
Henry Lord Bishop of London.

ARGUMENT.

Occasion of this Letter. Judgment of Calvin, Piscator, Pool and Hammond. A Paraphrase of the first nine Verses of St. Matthew, Chap. iv. The precise time of Christ's Temptation. What Motives led him over into the Desert. Whether the Devil knew the Mystery of our Redemption? Whether his carrying over of our Saviour was real? Which is the natural Order as to this Narration, that of St. Matthew, or that of St. Luke? How the Houses of Jerusalem were built? How the Devil might shew to Jesus all the Kingdoms of the World, and their Glory?

My Lord,

WHen I began to write in the *English* Tongue, I presum'd to dedicate the first Month of my *Works of the Learn'd* to your Lordship, not only by a Motive of general Gratitude for the Paternal Care you have taken of the persecuted Protestants of my Nation, but more particularly as being your Lordship's spiritual Son, and a Member of this most pure Church by your Consecration.

But since Sons are either the Glory or the Shame of their Father, it is but just that I should give you an account of the progress of my Studies. I am forc'd every day to write upon very nice matters, and have almost no other humane Succours but my own Imagination, my Library being very small, and most of my former Notes and Papers having been lost, by several accidents. In the

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mean while I oft receive Commendations or Censures from several persons according to their Prejudices; and therefore being near the end of my career in this undertaking, I thought fit to follow the establish'd course, and to submit all to your Lordship's Judgment, being persuaded that your Learning and Prudence is so great, as that you will not fail to encourage me to continue these *Memoirs*, if they are worth your Lordship's perusal.

In the XLI Letter I have unawares started a difficulty, which I know not whether I shall be able to resolve. An anonymous person has reproach'd me, that I promis'd more in the Arguments, than I could perform in the Letters, as when I write there, *Christ's Fast and Temptation explain'd*; whereas, said he, you have made but a short Paraphrase on the two first Verses. I answer'd, that my design at that time requir'd no more; however that I was willing to try whether I could explain this History, one of the most difficult in all the Gospel.

Coming home, the first Book that fell into my hands, was *Calvin's* harmony on the three first Gospels: A most eloquent and judicious Author, who was extraordinary well acquainted with the diseases and necessities of his time, and knew best how to cure them; but his many occupations, and the studies of his Age did not afford him a sufficient insight in the knowledge of Tongues, and critical Learning. Then I read over *Piscator* upon this place, but could not find an observation for my purpose, all that he says is so very mean and scholastical. I thought therefore that the Modern Commentators would be more helpful to my design, and accordingly I got the celebrated *Pool* in *English*, who seem'd to me more proper for some sort of Preachers, than for a Critick. At last I consulted the learned *Hammond*, in whom I found but three Notes on the words *Διδάσκει* *ἀπερὶ τοῦ* *ὅτι* *παραζητεῖ*, so that at the end of all my reading, I was got no far h r than the beginning.

Then I read over and over the *Greek* Original, and fram'd thereupon the following Paraphrase.

Ver. 1. 'About the end of the Month of *September*, or the beginning of *October*, in the 30th year of our Saviour's life, as soon as he had been baptiz'd, he was led by the direction of the Infinite Wisdom, with whom he was hypostatically or most intimately united, and of whose gifts he had receiv'd a new increase in his Baptism, *Matth. iii. 16, 17.* so that he was as full of the *Holy Ghost*, *Luke iv. 1.* He was led, I say, into a solitary place, situated above the River *Jordan*. His intent, as a Man, was to prepare himself in that retirement for the important office to which he had been consecra-

‘secrated, and to implore the blessing of his Father upon his future
‘labours; but the design of the Infinite Wisdom, was to let him
‘obtain a glorious Victory over the great Adversary of Man-
‘kind.

Ver. 2. ‘Being come there, the vehemency of his Zeal and Pray-
‘ers carry’d him into an extatick ravishment, that lasted 40 days and
‘40 nights, at the end of which, his body resuming his natural fun-
‘ctions, he felt the sharpness of hunger.

Ver. 3. ‘Then the great Seducer of Spirits came near him, in a
‘visible and pleasant shape, dissembling his inveterate hatred and
‘malice, under pretences of friendship, as tho he had been a good
‘Angel much concern’d for his circumstances. This place, says he,
‘affords no sustenance, nor the season any wild fruits; but what need
‘you to lie in that anguish, and willingly starve your self; since you
‘are the Son of God, as you persuade your self, by the voice you
‘heard, before you came hither; you have no more to do, than to
‘command these stones to be turn’d into bread.

Ver. 4. ‘It’s true, answer’d Jesus, I am intimate with the Infinite
‘Wisdom, but ’tis only to perform her commands, or to follow the
‘motions she is pleas’d to give me, and not by murmuring and im-
‘patience to force her, in a manner, to comply with my appetites.
‘This would be a sin like to that of the *Israelites*, who, tho they had
‘receiv’d so many deliverances from the Almighty, never rely’d fully
‘upon him. As for me, I am persuaded, that God being all good
‘and unchangeable, he will never forsake me, and therefore that ra-
‘ther than to let me perish, he will cause a new *Manna* to rain from
‘Heaven. For as *Moses* intimates, *Dent. viii. 3.* bread and meat are
‘indeed the ordinary, but not the only food of Man: God’s word
‘and providence may supply the want of those aliments, and keep
‘him by other means.

Ver. 5, and 6. ‘However, reply’d the tempting Spirit, I would not
‘trust so much upon my own Revelations, for they may be mistakes
‘of the Senses and Imagination, come with me to *Jerusalem*, I’ll put
‘you in the way to know certainly whether God be so much your
‘Friend, as you believe. Being arriv’d there, he plac’d him on the top of
‘the Temple near the Battlements, and pursu’d thus his discourse:
‘You are almost starv’d; and have but few days, and perhaps few
‘hours, to live. Put an end to your miseries. Cast your self down
‘head-long; for if you really be the Son of God, he will order his
‘Angels to take care of you, and to bear you up as in their hands,
‘lest you should dash your foot against a stone, according to the so-
‘lemn promise of the Prophet, *Psal. xci. 11, 12.*

Ver.

Ver. 7. 'No, answer'd our Saviour: This would be again the Sin
' of the mistrusting *Israelites*, who were never satisfy'd, what favors
' soever God bestow'd upon them. I have receiv'd sufficient
' proofs of his love and beneficence, and do not require any more,
' remembring that Precept of his Law, *Thou shalt not tempt the Lord*
' *thy God*, Deut. vi. 16.

Ver. 8, 9. These wise Answers might have discourag'd any other
besides the most obstinate and wicked of all spirits, but he had still
an arrow in his quiver, which he would shoot at that invulnerable
breast: 'Whatever I may say, pursu'd he, I cannot persuade you to help
' your self; but I have so much love for you, that I will yet endeavour
' to do it. Whilst he spake thus, he carry'd *Jesus* upon a Mountain ex-
ceedingly high, where, disposing as much matter as he has power to
move into the image of the utmost grandure and magnificence of
this world, as may be the stately entrance of a *Roman* General on a
Triumph-day, he added: 'I know what you aim at, you would
' fain be acknowledg'd by your Nation for the Messiah, and I own
' that you resemble him very much. However, I dare tell you that
' it will never succeed, because they long for a temporal King, and a
' Conqueror that may deliver them from the *Roman* Yoke, and sub-
' due the rest of the world. But you want Riches, the main sinews
' of War and Government. This it is in my power to give, for I
' am one of those great Angels, whom God has intrusted with the
' government of the world, *Dan. x. 13, 20.* and I will bestow it upon
' you, if you will become my Servant; and, for a token of your
' engagement, cast your self to the ground, and worship me.

Ver. 9, 10. *Jesus* had been ere now sensible, that this fair Pretender
was a wicked Spirit, since good Angels are not us'd to discourage
pious Men. However, according to the Rules he has given himself
against light and uncharitable Judgments, he had patiently born all
this Seducer's Temptations to this very last, when he broke out in
these words full of a just and holy indignation: 'Get thee hence,
' Satan, sworn Adversary of God and Mankind. Art thou not a-
' sham'd, to pretend even to Adoration, that supreme homage of our
' Soul, which God has reserv'd to himself, since 'tis said in his Law, *Thou*
' *shalt worship the Lord thy God, and him only shalt thou serve*, Deut. vi. 13.

Some sort of People will perhaps wonder at this Paraphrase, but
I leave your Lordship and the impartial Reader to judge of it, after I
have added some few Notes.

Ver. 11. Tote, Then. *Jesus* was about 30 years of age when he was
baptiz'd, *Luke iii. 23.* He dy'd about the end of *March*, after ha-
ving preach'd three years and a half, according to the common opi-
nion,

nion, which may be easily made out of the Gospels, and therefore this History happening immediately after his Baptism, fell out about the end of *September*, or the beginning of *October*.

Jesus was led up of the Spirit into the Wilderness: ἀνέχθην, led up, in the Hebrew Phraseology denotes, that this solitary place was in a higher situation than the River *Jordan*. This is observed, that the *Jews* of that time might know where that miraculous Scene had been acted.

To be tempted by the Devil. Some supply the Adverb ἕνεκα before πειρασθῆναι, to the end that he might be tempted; but I rather understand the Participle μέλλων ubi futurum erat, where he was to be tempted. Because tho this Temptation, and the subsequent Victory, might be the principal aim of the Infinite Wisdom, yet she did not always reveal to our Saviour, whatever she design'd concerning him and his Church, *Mark* xiii. 32.

Ver. 2. And having fasted forty days and forty nights, &c. Concerning this Ecstatic Fast, the Reader may see the *XLI* Letter of these *Memoirs*, p. 313.

Ver. 3. If thou be the Son of God. Since neither the Prophets, nor the good Angels, did perfectly know the Mystery of our Redemption, before it was fulfill'd, *1 Pet.* i. 10, 11, 12. there is little appearance that the Devil, whose knowledge of future Events is grounded upon meer conjectures, should have been better acquainted with it. Neither is it probable that by his oppositions, as the possessing of so many Men, the stirring up of the heads of the *Jews*, the seducing of *Judas*, the persecuting of the first Christians, &c. he would have concurr'd to its performance; had he been certain that it was by the death of the *Messiah*, and the sufferings of his first Disciples, that Mankind was to be sav'd, and the Gospel to be spread through all the world. He might know that *Jesus* was the *Messiah*, as being born at *Bethlehem*, and of the Family of *David*, and the time of that great Deliverer's coming being fulfill'd. But as to *Christ's* or *God's* designs, and the manner of their performance, he was altogether unacquainted with 'em, and so very false in his conjectures, that he always mistook, as appears by his unsuccessful contradictions. And therefore I am apt to believe, that he went to that solitary place, in order to find out our Saviour's intention, to deter him from them, or to seduce him, if possible.

Ver. 5. Then the Devil takes him up into the Holy City, the surname of *Jerusalem*, *Psal.* xlviii. 1, 2. *Matt.* xxviii. 53. *Luke* iv. 9. The Greek word παραλαμβάνει, translated takes up, does not plainly mark whether the Devil carry'd over *Jesus* through the Air, or whether they

they walk'd together so far. The latter appears more natural, but the former seems more agreeable with the circumstances of the History. 1. Because the Temptation lasted but few hours, otherwise our Saviour would have known, detested, and sent him away, as he did when that proud Seducer endeavour'd to intice him to Idolatry; for the shrewdest Villain in the world will discover himself in a long conversation, in which he labours to persuade an honest and ingenious Man to wicked Actions. 2. Because a fasting Man cannot run very swift, neither must we have here recourse to a miracle; for it seems that the Infinite Wisdom left in this occasion the Man *Jesus* to himself, that his humanity might have the whole glory of this great victory, and be a worthy subject of her love and union. 3. Wherever soever the Desert and Mountain mention'd in this History be situated, they are not near *Jerusalem*; so that ordinary walking would have requir'd too much time. 4. *Jesus* might have been known in the way, and taken off from the company of the wicked Spirit. It must not be objected, that this carrying over would have frighted our Saviour, for a good Conscience, especially such an untainted person as he was, fears nothing. Besides, that he knew how often Prophets had been carry'd over by the Holy Ghost or good Angels.

St. *Luke* relates the third Temptation before the second, but the order of St. *Matthew* is the true thread of the Narration, as will appear to any considering Man. God has suffer'd such transpositions to slip into the Gospels, that any one might see there was no private Plot amongst the Historians of his Son, but each of them mention'd what he knew of him, to the best of his remembrance.

And sets him on a pinnacle of the Temple. As Rain is not frequent in *Judaea*, so the top of the houses in *Jerusalem* was flat, and surrounded with Battlements, so that People could walk upon them without danger. And I remember to have read in the *Uses and Customs of the Jews*, written by *Leo of Modena*, an Italian Rabby, that they celebrated the Feast of the Tabernacles on the top of houses, especially in great Cities; so that ἐν τῷ πτερύγῳ, signifies on or near the Battlements.

Ver. 7. *Jesus said to him, it is written again.* The learn'd Knatchbully would have us read and translate thus, *Jesus said to him again, 'tis written.* But I prefer the common reading and translation, because πάλιν again is not here superfluous, both passages alluding at the diffidence of the *Jews*.

Ver. 8. And shews him all the Kingdoms of the world, and the glory of them. That this was not done in a Vision, is plain by the Text ; for *Jesus* was hungry when the Tempter came to him, *ver. 2, 3.* And 'tis absurd to assert, that part of the Temptation was perform'd whilst our Saviour was awake, and the other in a Vision or a Dream. Besides that, the Devil to raise such perceptions in our Lord, without the help of outward objects, must have immediately mov'd the fibres and nerves of his brain, or determin'd the course of his vital spirits to such and such motions. A power, which, in my opinion, a wicked spirit never had over just Men ; for otherwise, who could resist his temptations, the Soul being so dependent on the Body ? Neither is there any Mountain so high , that all the Kingdoms of the world may be seen from it, nor any eyes so piercing that they may discover all their glory. And therefore this Phrase is a popular expression, to signify that the great Seducer represented him by the help of exhalations and aerial corpuscles , whatever can best flatter ambitious Souls, or an Image of the most stately pomp and magnificence of this world, as the Coronation of a great King or Emperor, or the Triumph of a Roman General, one of the three wishes of *St. Austin.*

Decemb. 4.

F I N I S.

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